Missouri Department of Higher Education

Building Missouri's future... by degrees®

NEW PROGRAM PROPOSAL FORM

Sponsoring Institution(s): University of Central Missouri

Program Title: Master of Science in Education, Elementary Mathematics Specialist

Degree/Certificate: Degree: Master of Science in Education, Elementary Mathematics Specialist

Options:

Delivery Site(s): University of Central Missouri Warrensburg campus/online

CIP Classification: 13.1311

*CIP code can be cross-referenced with programs offered in your region on MDHE's program inventory highered.mo.gov/ProgramInventory/search.jsp

Implementation Date: Summer 2014

Cooperative Partners: Five universities (UCM, MU, MSU, NWMSU, SEMO) have collaborated to develop and offer the courses that are being used in this program. Students pursuing this degree from UCM will actually take courses that are taught by faculty at other universities. The students will enroll and receive credit from UCM but instruction for some of the courses will be delivered from another campus. The format of the courses is a highly interactive online environment. Representatives of the collaborating universities have agreed to maintain this agreement through the first offering of each of the courses.

*If this is a collaborative program, form CL must be included with this proposal

AUTHORIZATION:

Michael J. Grelle, Vice Provost	[signature]	12/3/13
Name/Title of Institutional Officer	Signature	Date

Michael J. Grelle	660-543-4116
Person to Contact for More Information	Telephone

Evidence Market Demand/Societal Need

First, mathematics teaching must improve if students are to learn mathematics as described in the Common Core State Standards for Mathematics ([CCSSM], 2010). Implementation of the CCSSM will require elementary teachers to acquire additional mathematics knowledge, skills, and practices, as well as increase their capacity to more effectively use what they know and can do (Ball, Thames, & Phelps, 2008). The implementation of the CCSSM makes the creation of the proposed degree program timely and important.

Second, efforts to improve mathematics instruction and learning at the elementary level will require teaching models that differ from current practice. There is consistent evidence that many practicing elementary teachers are not adequately prepared to meet the demands for increasing student achievement in mathematics. Publications from the National Council of Teachers of Mathematics (2000), the Association of Mathematics Teacher Educators (2010), and the National Mathematics Advisory Panel (2008) emphasize that most elementary teachers are generalists and, as such, are expected to teach all core subjects. Thus, many never develop the in-depth knowledge and expertise needed to effectively teach teachers. Elementary Mathematics Specialists will be able to assist other teacher with content related issues.

Third, a program of study for elementary mathematics specialists must provide courses, experiences, and resources that help teachers deepen their content knowledge and enhance their instructional skills. The Association of Mathematics Teacher Educators (2010) has provided specific recommendations about the knowledge and skills necessary for elementary mathematics specialists. More recently, the Conference Board of Mathematical Sciences (2012) has published recommendations for the preparation of elementary teachers that takes into account the Common Core State Standards for Mathematics

Evidence of need:
As part of the certification proposal presented to the Department of Elementary and Secondary Education, a survey was conducted to determine interest in an Elementary Mathematics Specialist program. Over 350 Missouri teachers and administrators representing every RPDC region in the state responded and indicated strong support. For example:

- 83% of respondents answered "yes" to the question, "Is there a need for specialized training to help some teachers become lead math teachers (math coaches or math specialists) in schools or districts in your area?" (12% indicated "not sure" and 5% indicated "no")
- 94% of respondents answered, "yes" to the question, "Would you be in favor of the state offering a new certificate focused on K-5 mathematics specialist (as an advanced or second teaching certificate)?" (4% indicated "not sure" and 1% indicated "no")

- Over a third of the respondents (129) indicated that they would personally be interested in pursuing an EMS certificate if Missouri offered it. Likewise, 58% of the respondents (200) indicated they knew teachers who would be interested.

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COLLABORATIVE PROGRAMS

Sponsoring Institutions: University of Central Missouri

Degree program: Master of Science in Education, Elementary Mathematics Specialist

Length of agreement: Five universities (UCM, MU, MSU, NWMSU, SEMO) have collaborated to develop and offer the courses that are being used in this program. Students pursuing this degree from UCM will actually take courses that are taught by faculty at other universities. The students will enroll and receive credit from UCM but instruction for some of the courses will be delivered from another campus. The format of the courses is a highly interactive online environment. Representatives of the collaborating universities have agreed to maintain this agreement through the first offering of each of the courses.

(open-ended or limited)

1. Which institution(s) will have degree-granting authority?
   Each collaborating university will have degree-granting authority.

2. Which institution(s) will have the authority for faculty hiring, course assignment, evaluation, and reappointment decisions?
   Each collaborating university will have authority for faculty hiring, course assignment, evaluation, and reappointment decisions for the courses being offered by that university.

3. What agreements exist to ensure that faculty from all participating institutions will be involved in decisions about the curriculum, admissions standards, exit requirements?
   Each university will make their own decisions about admission. Representatives from each university meet regularly to examine curriculum and make decisions regarding the curriculum.

4. Which institution(s) will be responsible for academic and student-support services, e.g., registration, advising, library, academic assistance, financial aid, etc.?
   Each university is responsible for the academic and student-support services needed by students enrolled at the university.

5. What agreements exist to ensure that the academic calendars of the participating institutions have been aligned as needed?
   The representatives from each university that meet for curriculum matters also deal with academic calendar issues. The representatives have agreed that the academic calendar of the university offering the course will be followed.

6. In addition to the information provided by each participating institution regarding Financial Projections (Form FP), please address the following items:
   1. How will tuition rates be determined if they differ among the institutions?
      Students pay the tuition rate of their own university since they enroll through their own university.

2. Has a formal agreement been developed regarding cost-sharing policies? If yes, please include it as part of the proposal. If no, please summarize the current understanding between all parties and the plans for developing a formal agreement.

Click here to enter text.

3. What arrangements, if any, have been made for exchange of money between participating institutions?
Click here to enter text.

7. What commitments have been made by all participants to evaluate the program systematically?
Representatives of each collaborating university have agreed to evaluate each course upon completion of the course. Student surveys will be used as will instructor input.

8. If one institution wishes to discontinue the program, what agreements exist for terminating the offering?
Since the collaborating universities are sharing curriculum materials, should one university choose to discontinue the program, the other universities will have the materials needed to offer the courses previously taught by the university seeking to discontinue participation.

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PROGRAM CHARACTERISTICS AND PERFORMANCE GOALS

Institution Name University of Central Missouri
Program Name Master of Science in Education, Elementary Mathematics Specialist
Date September 30, 2013

(Although all of the following guidelines may not be applicable to the proposed program, please carefully consider the elements in each area and respond as completely as possible in the format below. Quantification of performance goals should be included wherever possible.)

1. Student Preparation

- Any special admissions procedures or student qualifications required for this program which exceed regular university admissions, standards, e.g., ACT score, completion of core curriculum, portfolio, personal interview, etc. Please note if no special preparation will be required.
  Candidates must be previously certified as elementary or middle school mathematics teachers. Candidates must meet all Univeristy of Central Missouri requirements for admission to graduate school.

- Characteristics of a specific population to be served, if applicable.
  Candidates will be certified elementary or middle school mathematics teachers.

2. Faculty Characteristics

- Any special requirements (degree status, training, etc.) for assignment of teaching for this degree/certificate.
  Faculty will be mathematics education faculty from the Department of Mathematics and Computer Science or elementary education faculty from the Department of Elementary and Early Childhood Education. Adjunct faculty will be assigned to teach the Internship courses.

- Estimated percentage of credit hours that will be assigned to full time faculty. Please use the term "full time faculty" (and not FTE) in your descriptions here.
  Approximately 88% of the credit hours will be assigned to full time faculty.

- Expectations for professional activities, special student contact, teaching/learning innovation.
  The courses are designed as highly interactive online courses that include some face-to-face meetings. The internships are supervised by adjunct faculty.

3. Enrollment Projections

- Student FTE majoring in program by the end of five years.
  60

- Percent of full time and part time enrollment by the end of five years.
  The courses in the program are sequential in nature. We expect nearly 100% of the students to be enrolled in 4 – 6 hours each semester.

4. Student and Program Outcomes

- Number of graduates per annum at three and five years after implementation.
  Three years – 30 graduates per year. Five years – 30 graduates per year.

- Special skills specific to the program.
  Successful candidates will demonstrate:
  •Deep understanding of how students learn mathematics and of the pedagogical knowledge specific to mathematics teaching and learning.
  •Understanding of specific concepts and procedures as well as the process of doing mathematics.
  •Confidence in their ability to do and teach mathematics.

- Proportion of students who will achieve licensing, certification, or registration.
  100%

- Performance on national and/or local assessments, e.g., percent of students scoring above the 50th percentile on normed tests; percent of students achieving minimal cut-scores on criterion-referenced tests. Include expected results on assessments of general education and on exit assessments in a particular discipline as well as the name of any nationally recognized assessments used.
  Candidates are required to pass the PRAXIS II exam required for certification as a middle school mathematics teacher.

- Placement rates in related fields, in other fields, unemployed.
  100% of the candidates are employed as either elementary or middle school mathematics teachers.

- Transfer rates, continuous study.
  The courses are primarily online in nature so transfer by students is not anticipated. The courses were developed collaboratively by 5 universities so the program is available and courses would transfer to those universities.

5. Program Accreditation

- Institutional plans for accreditation, if applicable, including accrediting agency and timeline. **If there are no plans to seek specialized accreditation, please provide a rationale.**

The National Council of Teachers of Mathematics offers accreditation for programs for elementary mathematics specialists. We will seek to become an accredited program and will apply for accreditation following the graduation of the first cohort of candidates.

6. Alumni and Employer Survey

- Expected satisfaction rates for alumni, *including timing and method of surveys.*
  The training and use of elementary mathematics specialists responds to a need in our schools. In addition, this program is supported by higher education across the state. We will ask candidates to complete a survey at the end of each course and use this data to inform the design of subsequent courses. Because of this, we anticipate satisfaction to be at a high rate. We will also ask candidates to complete a follow-up survey similar to the TEAC survey used at UCM.

- Expected satisfaction rates for employers, including timing and method of surveys.
  We expect the satisfaction rate to be high. We will ask employers to complete a follow-up survey similar to the TEAC survey used at UCM.

7. Institutional Characteristics

- Characteristics demonstrating why your institution is particularly well-equipped to support the program.
  The University of Central Missouri has been part of a 5 university collaborative that worked to develop a certification proposal for DESE and, more recently, a set of courses that would lead to certification as an Elementary Mathematics Specialist. Because of this, UCM faculty have knowledge of the need for and ways to assist candidates in their preparation as elementary mathematics specialists. Faculty from the Department of Mathematics and Computer Science (College of Health, Science, and Technology) and the Department of Elementary and Early Childhood Education (College of Education) have worked collaboratively to design this MSE program. Because of this collaboration and the support we have received from the deans of the colleges involved, we believe UCM is well-equipped to offer this program.

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PROGRAM STRUCTURE

A. Total credits required for graduation: 30

B. Residency requirements, if any: _____

C. General education: Total credits: 0

Courses (specific courses OR distribution area and credits):

Course Number	Credits	Course Title

D. Major requirements: Total credits: 30

Course Number	Credits	Course Title
Math 5800	3	Number and Operations for Elementary Mathematics Specialists
Math 5810	3	Rational Numbers and Proportional Relationships for Elementary Mathematics Specialists
Math 5820	3	Algebraic Reasoning for Elementary Mathematics Specialists
Math 5830	3	Geometry and Measurement for Elementary Mathematics Specialists
Math 5840	3	Data and Probability for Elementary Mathematics Specialists
ECEL 5800	1	Internship in Number and Operations for Elementary Mathematics Specialists
ECEL 5810	1	Internship in Rational Numbers and Proportional Relationships for Elementary Mathematics Specialists
ECEL 5820	1	Internship in Algebraic Reasoning for Elementary Mathematics Specialists
ECEL 5830	1	Internship in Geometry and Measurement for Elementary Mathematics Specialists
ECEL 5855	2	Foundations of Mathematical Leadership for Elementary Mathematics Specialists
ECEL 5860	3	Mathematical Leadership for Elementary Mathematics Specialists: Influencing and Facilitating Improvement
ECEL 5240	3	Leadership and Analysis of Teaching Children

ECEL 5920	3	Childhood Research and Development

E. Free elective credits:
0
(Sum of C, D, and E should equal A.)

F. Requirements for thesis, internship or other capstone experience:
Candidates complete 4 1-hour internships as part of the program. Each of the internships is taken concurrently with the associated content course.

G. Any unique features such as interdepartmental cooperation:
This program represents the collaboration of the Department of Elementary and Early Childhood Education and the Department of Mathematics and Computer Science. Candidates will complete coursework in both departments.

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STUDENT ENROLLMENT PROJECTIONS

Year	1	2	3	4	5
Full Time	**25**	**+30**	**+30**	**+30**	**+30**
Part Time					
Total	**25**	**55**	**60**	**60**	**60**

Please provide a rationale regarding how student enrollment projections were calculated:

We are offering a course leading to certification this fall and did not advertise the course extensively. We had over 40 inquiries and 25 students completed the enrollment process. All of these 25 students have expressed a desire to pursue a MSE, Elementary Mathematics Specialist degree. We believe this indicates a need for this degree and that with additional advertising the enrollment projected above will occur.

Provide a **rationale** for proposing this program, including **evidence of market demand and societal need supported by research**:

Background information:

In June 2012, the Missouri Department of Elementary and Secondary Education approved an advanced teaching certificate for Elementary Mathematics Specialists. The certification is awarded upon completion of a 24-hour program of study including mathematics content courses, mathematics education leadership courses, and practicum experiences. Missouri is one of a growing number of states to offer this certification. The use of Elementary Mathematics Specialists is being viewed as a practical alternative to increasing all elementary teachers' content knowledge by focusing the need for expertise on fewer teachers.

The proposed Master of Science in Elementary Education, Elementary Mathematics Specialist includes the courses needed for certification as an Elementary Mathematics Specialist. When students are awarded this degree, they will be certified and prepared to fill a variety of roles including mathematics instructional coaches, mathematics resource teachers, providers of mathematics professional development, and grade level mathematics specialists.

The proposed degree program was developed through collaborative efforts of the Department of Elementary and Early Childhood Education and the Department of Mathematics and Computer Science. Each of these departments will offer some of the courses required for the degree.

The mathematics content, leadership, and practicum courses that make up the majority of the courses in the proposed degree program were developed collaboratively by mathematics educators at the University of Central Missouri (UCM), the University of Missouri-Columbia, Missouri State University, Northwest Missouri State University, and Southeast Missouri State University. The collaborative nature of the development process means that UCM students will be exposed to the experience and knowledge of mathematics teacher educators from diverse backgrounds. In addition to collaborating on curriculum development, these universities are also collaborating to offer the courses. Students in the program enroll, pay tuition, and receive credit through their home university but may actually receive instruction from one of the other universities. Each collaborating university is responsible for delivering one or more of the content and leadership courses.

Rationale:

The proposed degree program is based on the following premises:

First, mathematics teaching must improve if students are to learn mathematics as described in the Common Core State Standards for Mathematics ([CCSSM], 2010). Implementation of the CCSSM will require elementary teachers to acquire additional mathematics knowledge, skills, and practices, as well as increase their capacity to more effectively use what they know and can do (Ball, Thames, & Phelps, 2008). The implementation of the CCSSM makes the creation of the proposed degree program timely and important.

Second, efforts to improve mathematics instruction and learning at the elementary level will require teaching models that differ from current practice. There is consistent evidence that many practicing elementary teachers are not adequately prepared to meet the demands for increasing student achievement in mathematics. Publications from the National Council of Teachers of Mathematics (2000), the Association of Mathematics Teacher Educators (2010), and the National Mathematics Advisory Panel (2008) emphasize that most elementary teachers are generalists and, as such, are expected to teach all core subjects. Thus, many never develop the in-depth knowledge and expertise needed to effectively teach teachers. Elementary Mathematics Specialists will be able to assist other teacher with content related issues.

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Evidence of need:

As part of the certification proposal presented to the Department of Elementary and Secondary Education, a survey was conducted to determine interest in an Elementary Mathematics Specialist program. Over 350 Missouri teachers and administrators representing every RPDC region in the state responded and indicated strong support. For example:

- 83% of respondents answered "yes" to the question, "Is there a need for specialized training to help some teachers become lead math teachers (math coaches or math specialists) in schools or districts in your area?" (12% indicated "not sure" and 5% indicated "no")
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Plans for Accreditation

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Rationale for Proposal of Program

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